SUMMARY PAGE

PROJECT TITLE: EPA/DERA State Allocation Program

PROJECT MANAGER AND CONTACT INFORMATION:

[redacted]

PROJECT BUDGET OVERVIEW:

	FY 2017	FY 2018
EPA Base Allocation	Not applicable	$284,809
State or Territory Matching Funds (if applicable)	Not applicable	$284,809
EPA Match Incentive (if applicable)	Not applicable	$142,405
Mandatory Cost-Share	Not applicable	$1,281,644
TOTAL Project	**Not applicable**	**$1,993,667**

PROJECT PERIOD: October 1, 2018 – September 30, 2019

SUMMARY STATEMENT:

It is the intent of TxDOT to purchase goods, equipment and services having the least adverse environmental impact, within the constraints of statutory purchasing requirements, TxDOT need, availability, and sound economic considerations. Suggested changes and environmental enhancements for possible inclusion in future revisions of this specification are encouraged.

Engines shall be manufactured by and branded as a product of Cummins, PACCAR, Mack, Volvo, Navistar, or Detroit Diesel. Only engines from these manufacturers are acceptable.

Engine repairs shall be available at any facility authorized as a repair provider by the applicable engine manufacturer. TxDOT will make selections based on "best value" that can be achieved for the citizens of Texas. An example would be the Detroit Diesel DD13, which can achieve a clean diesel best value.

TxDOT will add clean diesel dump trucks to its fleet. These dump trucks could be powered with the Detroit Diesel DD13 Engine, providing 370 HP and a torque of 1,650 lb-ft. The DD13 exhibits a FTP NO_x rating STD of 0.20 and CERT of 0.07. These additions will replace dump trucks exhibiting Tier 2, BIN 10, with new dump engines rated at Tier 4 Final emissions requirements. The DD13 engines are compliant with 2017 Greenhouse Gas (GHG17) requirements.

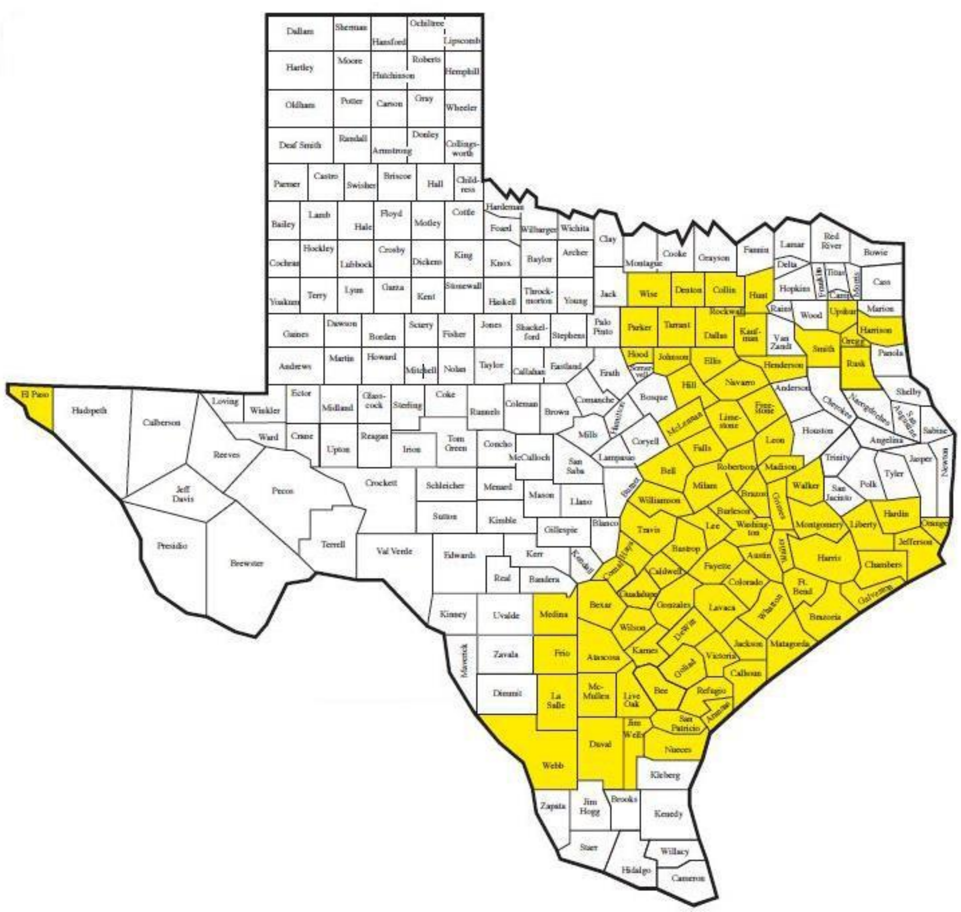
Diesel engine fuel filtration systems shall include at least two stages of filtration. Filter stages may consist of a primary and a secondary filter, or a two-stage filter in a common housing. At least one drain shall be provided in the system to prevent water damage to the injection system. All items shall be factory installed.

For example, the new DD13 engine provides enhanced emissions technology by using a completely integrated emissions system that combines exhaust gas recirculation (EGR), diesel particulate filter (DPF), diesel oxidation catalyst (DOC), and selective catalytic reduction (SCR) to efficiently meet emission standards. Further reductions are achieved by injecting diesel exhaust fluid (DEF) into the exhaust system.

- Working with TxDOT to review the fleet database for on-road and non-road activity data that could support emissions analysis and inform future MOVES model updates (Partially funded by EPA's CRADA and TxDOT IAC-A)
- CAP Calculator – assisted TxDOT with developing performance measures for the Clean Air Plan Calculator. Assisting with pulling fleet diesel data for emission reduction calculations
- RMC Fleet Research
    - RMC 5955 Characterization of In-Use Emissions from Non-road Equipment in the TxDOT Fleet
    - RMC 6266 Fleet Equipment Performance Measurement Preventive Maintenance Model (PM2)
- Deployment of Nett BlueMAX SCR System in TXDOT's Construction Fleet, USEPA Clean Diesel Emerging Technologies Program, 2009-2012

SCOPE OF WORK:

TxDOT, as a department of the State of Texas and in partnership with the Texas Commission on Environmental Quality (TCEQ), has assumed responsibility and authority form the Governor of the State of Texas to administer and participate in the Environmental Protection Agency (EPA) Diesel Emissions Reductions Act and Clean Diesel Funding Assistance Program (DERA). TxDOT operates the largest fleet in the State of Texas. This fleet is managed by the Fleet Operations Division (FOD). FOD supports a number of clean air attainment programs from its Fleet Services Section (FSS). The programs administered by FSS are focused in the Texas Clean Transportation Zone, which includes 47 Texas counties (see below):



Programs focus on the Texas Emissions Reduction Plan (TERP). The TERP program comprises eight different grant programs. Each program has its own specific eligibility requirements and may accept applications at different times of the year. The participation in these programs will be supported by the newly created State Alternative Fuels Fleet Grant Program specified by Texas SB 1731, Sec. 395. TxDOT will supplement TERP programs with EPA's DERA programs, including one-time VW settlement funding.

The eight TERP programs are:

1. Alternative Fueling Facilities Program (AFFP)
2. Drayage Truck Incentive Program (DTIP)
3. Emissions Reduction Incentive Grants (ERIG)
4. New Technology Implementation Grant (NTIG) Program
5. Texas Clean Fleet Program (TCFP)
6. Texas Clean School Bus (TCSB) program
7. Light-Duty Motor Vehicle Purchase or Lease Incentive Program (LDPLIP)
8. Texas Natural Gas Vehicle Grant Program (TNGVGP).

As identified in the draft of TxDOT's Long-Rang AFV Plan, upon securing adequate funding, work will expand in Zone 1 (Houston Area), in FY 18-19 and Zone 2 (Dallas-Fort Worth Area) in FY 20-21, and in FY22-23 proceeding to Austin, San Antonio, and El Paso.

TxDOT is having discussions with TCEQ regarding the VW settlement funds distribution. TxDOT has "shovel-ready" projects in six defined areas outlined in the settlement:

1. On-road medium to heavy duty trucks
2. Off-road heavy truck new diesel replacement
3. Heavy equipment new diesel replacement
4. Ferry and drayage truck replacement
5. EV charging infrastructure – installation of DC fast chargers
6. Fork lifts – all-electric with charging infrastructures

These projects will be administered by FOD along with TxDOT's Support Services and Maritime Divisions. Additional support will be provided by TxDOT's Environmental, Transportation Programming and Planning (TPP), Legal, Procurement, and Contract Services Divisions.

TxDOT has established a cross-functional project team to develop implement and monitor a long-range Alternative Fuel Vehicle (AFV) plan for all on-road vehicles and equipment within the Texas Clean Transportation Zone. This project team is charged with addressing the following areas:

1. Planning/Legislative
2. Costing/Funding (Grants)
3. Equipment/Maintenance (Pilots and Procurement)
4. Communications/Training
5. Public/Private Partnerships

The project team meets on a quarterly basis and the work groups outlined above meet monthly or as needed.

FSS is currently administering several initiatives within FOD. These include:

1. Annual purchase of CNG light-duty trucks
2. Annual purchase of bi-fuel CNG light-duty trucks
3. Annual purchase of bi-fuel propane light-duty trucks

FSS is conducting the following pilots and research initiatives:

1. CNG dump truck
2. Mid-range SUV electric vehicle (EV) and/or EV hybrid
3. Compact EV and/or EV hybrid
4. Sedan EV and/or EV hybrid
5. Medium Duty EV and/or EV hybrid
6. Enhanced GPS utilization and tracking regarding idle reduction
7. Dual fuel heavy-duty equipment (dump truck) CNG/diesel with University of Texas (UT) and National Science Foundation (NSF)

STATE/TERRITORY GOALS AND PRIORITIES:

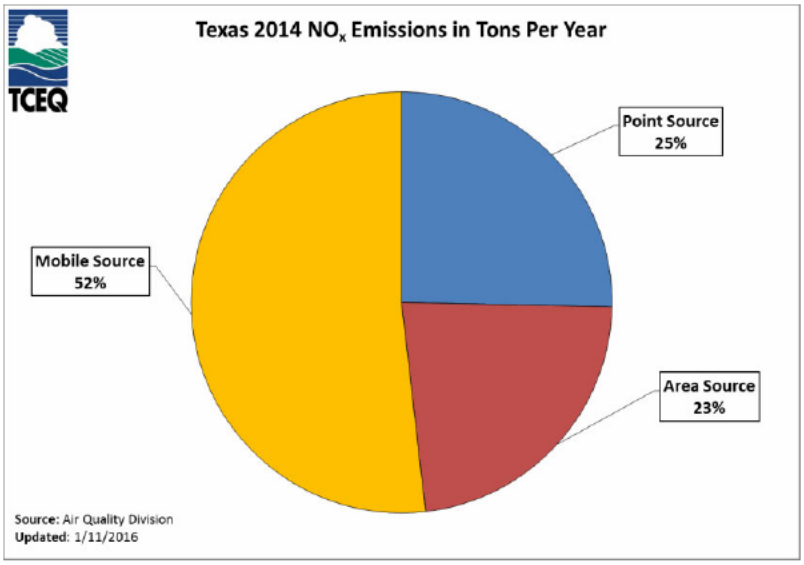
For NAAQS that are subject to transportation conformity (mobile sources contribute to emissions), Texas is attainment/unclassifiable for particulate matter ($PM_{2.5}$) and nitrogen dioxide (NO_2). Texas is attainment/unclassifiable for PM_{10}, except for the City of El Paso. Texas is attainment/unclassifiable for CO, except for a small portion of the City of El Paso that is CO attainment with the second 10 year maintenance SIP. Texas has experienced the largest total population increase of any state growing by 6.1 million people from 2000 to 2016, compared to a California increase of 3.9 million. Texas growth was larger than individual total state populations for 33 states. During this same time period, Texas reduced ozone (O_3) levels by 30% (6^{th} largest decrease nationwide).

Even with these large O_3 reductions, the greater Dallas-Fort Worth area and greater Houston area are nonattainment for the 2008 and 2015 O_3 NAAQS. While both areas remain nonattainment for the 2008 O_3 NAAQS, air quality continues to improve. Only 1 of 20 monitors in the greater Dallas-Fort Worth area and only 6 of 21 monitors in the greater Houston area had 2015-2017 design values above the 2008 O_3 NAAQS. (Quality, 2018). EPA designated the greater San Antonio area attainment/unclassifiable for the 2008 O_3 NAAQS and will make a final decision on the 2015 O_3 NAAQS by July 2018. All other areas of Texas were designated attainment/unclassifiable for the 2008 and 2015 O_3 NAAQS.

Ozone in Texas is nitrogen oxides (NO_x) limited, so TxDOT will focus DERA and TxDOT funds on NO_x reductions (ozone precursor) for our fleet. While replacing older, higher emitting vehicles will reduce all tailpipe emissions; TxDOT will focus DERA and TxDOT funds on NOx reductions for our fleet (ozone precursor). TxDOT has a simple goal: Reduce the emission

footprint of our fleet. Our priority is to focus initial vehicle replacements in ozone nonattainment areas to reduce NO_x.

According to TCEQ, mobile sources are responsible for 52% of NO_x emissions nationwide (see chart below).



Diesel mobile source emissions (without aircraft and GSE emissions because not all fuel types were known for these emissions) comprise 69.2 percent of total mobile source emissions. A further breakdown of Texas mobile source emissions are in the table below.

Mobile Source Subcategories	Tons	% of Total Mobile Source Emissions	TxDOT Equipment Categories
On-road Diesel	195,506.4	33.5	X
On-road Gasoline	155,291.3	26.6	
All Diesel Locomotive	54,343.9	9.3	
NR Diesel Agricultural	46,785.1	8.0	x
Diesel Drilling Rig Emissions	36,488.1	6.3	
NR Diesel Construction	35,337.5	6.1	X
All NR Diesel Commercial Marine	22,785.5	3.9	x
Aircraft and GSE Emissions (all fuels)	8,764.6	1.5	
All NR Gasoline	8,160.2	1.4	
All NR CNG and LPG	7,494.8	1.3	
NR Diesel Industrial	6,229.7	1.1	
NR Diesel Commercial	4,774.1	0.8	
NR Diesel Lawn and Garden	697.1	0.1	x
NR Diesel Logging	274.4	0.0	

NR Diesel Marine Recreational	232.7	0.0	?
NR Diesel Railroad Equipment	218.3	0.0	
NR Diesel Recreational	101.7	0.0	
Total Mobile Source Emissions	**583,485.4**	**100.0**	
Total Mobile Source Diesel Emissions (except aircraft and GSE)	**403,774.5**	**69.2**	

Source: TCEQ, 2014 NEI Emissions, 2018

Key Texas air quality successes demonstrate the state's ability to improve air quality. Between 2000 and 2016 these successes include: NO_2 decreased by 18% (one-hour NO_2) and 38% (annual NO_2), O_3 decreased by 27%, sulfur dioxide (not primarily a mobile source emission) decreased by 62%, and CO decreased by 72% (one-hour CO) and 74% (eight-hour CO). In addition, between 2002 and 2016, $PM_{2.5}$ decreased by 26% (24-hour $PM_{2.5}$) and 21% (annual $PM_{2.5}$). For air toxics, over 90 percent of the monitors operating from 2000-2014 (29 total across the state) showed a decrease in benzene annual average concentrations. In 2014, all monitors in Texas had annual average benzene concentrations below the state's safe level (Air Monitoring Comparison Value or AMCV). **Texas has the most extensive and aggressive monitoring program in the country for VOCs and air toxics.** Texas has 84 VOC monitoring sites; the state with the next highest number is California with 20. Evaluation of this VOC monitoring data show that overall, air in Texas is safe to breathe. Texas is a leader in the development of scientifically based guidelines (the AMCV) to protect public health and the environment. These guideline levels are set to prevent short and long-term health effects, vegetation effects, and nuisance odors. This method underwent an external scientific peer review and two rounds of public comment, making the method and levels developed using it scientifically sound. Other states and countries (e.g., Canada, Australia) closely watch and are using the levels developed by Texas. A 2009 letter from Acting Regional Administrator Starfield stated in a 2009 letter to Citizens for Environmental Justice:

> "TCEQ ambient air toxics monitoring, ESLs, and the Air Pollutant Watch List are all examples of ongoing State efforts that go above and beyond what EPA requires to help address community air toxics issues."
> -2009 Letter from Acting Regional Administrator (EPA Region 6), Lawrence Starfield, to Citizens for Environmental Justice

Further details on air quality successes for Texas are available at "TCEQ Air Quality Successes" at https://www.tceq.texas.gov/airquality/airsuccess/airsuccesscriteria. TCEQ State Implementation Plans have additional information on air quality in Texas (see: https://www.tceq.texas.gov/airquality/sip).

VEHICLES AND TECHNOLOGIES:

TxDOT's fleet consists of over 12,000 on-road vehicles and off-road equipment serving 25 districts across the State of Texas. Approximately 1,800 of these are diesel powered dump trucks ranging in age from 1 year to over 25 years old. The majority of these trucks are rated at emissions Tier 2, BIN 10. The new DD13 engines are fully Tier 4 Final compliant. These dump trucks are used in ongoing highway maintenance operations, as well as emergency response for hurricanes, wildfires, ice storms and floods

In terms of emission reduction, if 10 existing dump trucks producing a total NO_x of 44.50 g/bhp per hr. were replaced, the 10 new DD13 dump trucks will produce a total NO_x of 0.70 g/bhp per hr. This will provide a NO_x reduction of 43.8 G/BHP per hr.

Due to distance, power requirements, and limited alternative fuel (CNG/LPG) stations in certain parts of the state, diesel engine technology must still be deployed. Many emergency response situations severely limit the use of CNG/LPG engines. Dual fuel technologies are currently being researched for this sector with a target pilot date of 2018 and 2019.

A further example of the DD13 engines provide enhanced emissions technology by using a completely integrated emissions system that combines exhaust gas recirculation (EGR), diesel particulate filter (DPF), diesel oxidation catalyst (DOC), and selective catalytic reduction (SCR) to efficiently meet emission standards. Further reductions are achieved by injecting diesel exhaust fluid (DEF) into the exhaust system.

Pre-project, the dump trucks being replaced exhibited Tier 2, BIN 10 emissions. Post-project the trucks with new DD13 engines will experience ratings at the Tier 4 Final emission's requirements level. The DD13 exhibits a FTP NO_x rating STD of 0.20 and CERT of 0.07. The DD13 engines are compliant with 2017 Greenhouse Gas (GHG17) requirements.

TxDOT's Fleet Operations Division is and will remain the owner of the equipment (dump trucks and engines). The funding for this project will come from allocated capital funding from the State of Texas to TxDOT. As an alternative, pending settlement distribution, TxDOT would consider evoking the DERA Option as part of the State of Texas trust mitigation proceeds.

FOD conducts a bi-annual vehicle/equipment review with its 25 district customers. The analysis is performed utilizing its Capital Asset Module (CAM) based on a vehicle life cycle analysis. Maintenance costs, age, and funding are all taken into consideration. These plans, when reviewed annually, result in a "buy list" following legislative budget allocations.

ROLES AND RESPONSIBILITIES:

The Texas Department of Transportation's Fleet Operations Division maintains more than 12,000 fleet assets through a comprehensive preventive maintenance, repair and replacement program. The division manages fleet maintenance and purchasing for the department's 25 districts.

The equipment TxDOT proposes to purchase with DERA grant funds will replace older, higher emissions maintenance and construction equipment in the department's metropolitan districts located in non-attainment areas. TxDOT intends to use the funds within the agency and will not further distribute funds to other agencies through grant, loan or rebate programs. The funds will directly support TxDOT's fleet goals to support the department's needs and the state's clean air efforts

TxDOT has established a cross-functional project team to develop a long-term, sustainable Alternative Fuels Vehicle (AFV) implementation plan. This plan consisting of three 2-year and one 4-year sub-plans will be tied to the State of Texas fiscal biennium periods for budgeting purposes. Implementation will be focused in the metro cities within the state's defined Clean Transportation Zone.

TIMELINE AND MILESTONES:

TxDOT is preceding under EPA DERA direct implementation guidelines. TxDOT has 25 designated districts thought the State of Texas. FOD provides centralized coordination in terms of capital asset management and solicits input for its districts on an annual basis. Buy cycles are being modified to parallel our state's fiscal biennium.

The following task (T)/milestone (M) timeline is based on TxDOT's procurement buy cycle for FY 19 capital equipment. The timeline starts with TxDOT's normal buy cycle and is integrated with DERA in August 2018.

Description	Task/Milestone	Target Dates
Update Capital Asset Module (CAM)	T	1/2018
Align budget and project plans	T	1/2018 – 2/2018
Develop Preliminary Buy List	M	2/2018
Field Visits to Districts	T	3/2018 –6/2018
Adjust Buy List	T	7/2018
Integrate With State Funding	T	8/2018
Finalize Buy List	T	9/2018
EPA DERA State Allocation Program	M	10/2018 – 8/2019
Receipt of Funds	M	10/2018
Finalize dump chassis, engine and other items	T	12/2019

Order Dump Trucks	M	1/2019
Receive Parts for Assembly by State Prison	T	3/2019
Receive Finished Dump Trucks	T	4/2019 – 12/2019
Delivery to Districts	M	12/2019

DERA PROGRAMMATIC PRIORITIES:

Grant funds will directly support TxDOT equipment replacement in non-attainment areas. Specifically, equipment targeted for the project is located in the Dallas-Fort Worth and Houston regions. The equipment designated for the proposed project is owned by the Texas Department of Transportation and is used to transport highway construction and maintenance material to job sites within these locations.

According to the U.S. Census Bureau, the DFW Metroplex and HGB Metroplex are the fourth and fifth largest metropolitan areas in the United States, representing a combined population of 14,005,793. This combined population is greater than the population for each state except California, Texas, Florida and New York. According to the Bureau of Economic Analysis, DFW and HGB have the fourth and fifth largest gross metropolitan products (GMP) in the United States. DFW has approximately the tenth largest GMP in the world.

The vehicles will support transportation infrastructure development and maintenance for these areas as part of the state's largest fleet program. Texas has the largest multi-modal transportation infrastructure system in the United States. The DFW Metroplex encompasses 9,286 square miles, making it larger in area than Rhode Island and Connecticut combined. The HGB Metroplex is slightly larger, covering 10,062 square miles.

Tarrant, Dallas and Collin Counties are 100 percent within the 2008 ozone nonattainment area for Dallas-Fort Worth. Both counties have the two largest urban cores for the nonattainment area, with Fort Worth proper residing in Tarrant County and Dallas proper residing in Dallas County.

EPA'S STRATEGIC PLAN LINKAGE AND ANTICIPATED OUTCOMES/OUTPUTS:

TxDOT while participating in the EPA DERA State Allocation Program will strive to support attainment of the national ambient air quality standards (NAAQS) and implementation of stationary source regulations exhibited by the equipment/vehicles that are selected within the specific projects outlined in this proposal. Focus and measurement will center in NOx reduction by replacing tier II diesel engines with tier IV engines. Texas reduced its OZONE footprint by 30 % over the last 10 year measurement period. Ozone in Texas is nitrogen oxides (NO_x) limited, so TxDOT will focus DERA and TxDOT funds on NO_x reductions (ozone precursor) for our fleet. While replacing older, higher emitting vehicles will reduce all tailpipe emissions; TxDOT will focus DERA and TxDOT funds on NOx reductions for our fleet (ozone precursor). TxDOT has a simple goal: Reduce the emission footprint of our fleet. Our priority is to focus initial vehicle replacements in ozone nonattainment areas to reduce NO_x.

TxDOT has divided the Clean Transportation Zone Into three implementation zone segments Each zone segment has a sup-plan for active projects which are:

Zone 1 – Houston Metro Area

Zone 2 – DFW Metroplex Area

Zone 3 – Remainder of Clean Transportation Zone Counties

Projects in each zone are for specific two year periods that match the State of Texas fiscal biennium periods. State program funding, as well as state, federal, and private sector funding components are combined to consider program viability. Timelines and performance measures are then aligned prior to gaining approval to move forward.

TxDOT's Environmental Division, working with TCEQ, has defined existing NOx (outputs). With those benchmarks in place, TxDOT will be able to measure NOx reduction at each stage of project implementation (outcomes).

SUSTAINABILITY OF THE PROGRAM:

TxDOT has the largest state agency fleet in Texas; therefore, communication among TxDOT, TCEQ and the Governor's Office established that state DERA funds should be dedicated to the TxDOT fleet with TxDOT providing approximately 75 percent of matching contributions. Since its inception, TxDOT actively and successfully encouraged contractors to use the Texas Emission Reduction Program (TERP) program for making transportation infrastructure construction in Texas "greener." According to current legislation, the program will continue as long as ozone nonattainment areas exist in Texas. TxDOT will share the results of green fleet initiatives through the agency's annual statewide internal Clean Air Plan (CAP) and will share results with local air quality partners (cities, counties, metropolitan planning organizations, and councils of governments). TxDOT will also share results with the public through the statewide public outreach program called Drive Clean Texas (includes public outreach via PSAs, public meetings, and various electronic media). The goal of this public outreach program is to raise awareness about the impact of vehicle emissions on air quality and motivate drivers to take steps to help keep the air clean (for details see: http://www.drivecleantexas.org/).

The air quality successes outlined in the state/territory goals and priorities indicate dedication, commitment and knowledge shared by TCEQ and TxDOT to work together in a collaborative fashion to improve air quality. The two agencies have established communications to continue this success into the future.

In addition, the TERP program has projected funding for the 2016-2017 biennium at $241,098,555 million. (For TERP program details see: https://www.tceq.texas.gov/airquality/terp; for TERP funding details see page v at: https://www.tceq.texas.gov/assets/public/comm_exec/pubs/sfr/079-16.pdf). From 2001 to 2016, the TERP Emission Reduction Incentive Grant program has eliminated over 171,000 tons of NO_x and awarded over a billion dollars in funding. (For the 15-year detailed project list, emission reductions results and funds expended see: https://www.tceq.texas.gov/assets/public/implementation/air/terp/reports/FY17/DERI_ActiveProjectList.pdf). TxDOT construction contractors are documented throughout this project listing.

BUDGET NARRATIVE:

Itemized Project Budget

	FY 2017*			FY 2018			
Budget Category	EPA All.	Voluntary Match (if applicable)	Mandatory Cost-Share (if applicable)	EPA Allocation	Voluntary Match (if applicable)	Mandatory Cost-Share (if applicable)	Total
1. Personnel							
2. Fringe Benefits							
3. Travel							
4. Supplies							
5. Equipment				$427,214	$284,809	$1,281,644	$1,993,667
6. Contractual							
7. Program Inc.							
8. Other							
9. Total Dir. Chg.							
10. Indirect Chg.							
Total				$427,214	$284,809	$1,281,644	$1,993,66

**FY 2017 *Budget is only for states and territories with open FY 2017 State DERA grants*

Matching Funds and Cost-Share Funds

FOD receives capital funding through legislative authority on a biennial basis. The capital funding includes the purchase of minor equipment, transportation items, and heavy equipment for construction. FOD procures the vehicles and equipment through a procurement bid process.

Funding Partnerships

TxDOT serves its 25 districts located across the State of Texas. TxDOT will proceed under DERA's direct implementation guidelines as outlined in Section XIII, Appendix A , FY 2017-2018 State Clean Diesel Grant Program Information Guide, also in accordance with applicable competitive requirements in 2 CFR Part 200.